4.5 VISUAL QUALITY/AESTHETICS

4.5.1 Visual Impacts of Proposed Buildings, Wind Turbines and Other Site Features

The Proposed Action would add new and larger features to the site that would be visible from off-site locations, but these impacts would not be considered significant because the new features would be reasonably consistent with existing features, views would not be blocked, and NREL's building and facility design review processes would be implemented to reduce visual and aesthetic impacts.

Eight photographs are presented in Figure 4-1 to characterize the potential visibility of existing and proposed buildings, wind turbines, solar facilities, and other site facilities and features. These photographs are presented at the end of Chapter 4. The horizontal lines represent a rough approximation of the maximum hub heights of five 5-megawatt-class turbines distributed evenly across the test site area in a worst-case configuration. The vertical lines represent approximate site boundaries. These lines, and the assumptions discussed in Chapter 2 that form the basis for these approximations, are subject to change.

The maximum hub heights of 446 feet (135 meters) would be over three times the hub height of the existing 600 KW turbines, which are 120 feet (36 meters) high and higher than the existing meteorological towers, which are 264 feet (80 meters). The blade diameters on the 5-megawatt turbines would be 221 feet (67meters) longer than those on the largest turbines (0.6 megawatts = 600 kilowatts) currently on the site. The maximum height for future meteorological towers is 594 feet (180 meters), which would be 330 feet (100 meters) higher than existing towers. Buildings would not exceed approximately 75 feet (22.7meters). The solar facilities will be well below 66 feet (20 meters) in height.

Preliminary consultation with FAA indicates that red hazard lights similar to the fixtures on existing towers would be needed on the taller turbine and meteorological towers, and might be needed in multiple locations for these towers (Bauer, 2001). No significant visual impact would be anticipated by these future lighting requirements because the fixtures would be the same or similar to those already on the site.

As described in Chapters 1 and 2, the configurations of wind turbines, meteorological towers and related facilities change over time within the test site area and future building locations and design features have not been developed, so detailed long-term visual characteristics of the site cannot be presented and views from surrounding vantage points of turbines and towers will continue to change. However, it is clear that the addition of taller towers, longer turbine blades, several new buildings, the addition of solar facilities that have not been placed on this site before, use of new test sites for turbines and towers and increased use of the test site area would create "new" visual elements in the landscape over time as development occurs and more devices are gradually placed on the site and new technologies are tested. It is also clear that these new facilities would be more visible from all off-site vantage points (see Figure 4-1, photographs 1-8). However, the overall appearance of the site would be relatively constant with periodic changes occurring from new configurations. The new buildings would be most visible from vantage points north and east of the site.

Wind turbines are typically visible from off-site locations because they must be located in windy areas characterized by open terrain with limited interruptions of wind from trees or buildings.

Consequently, basic visibility is relatively unavoidable except in extremely remote locations. The perception of wind turbines, solar power devices and related facilities generates different reactions from different people. Some people find man-made intrusions of this type or other changes in a viewshed objectionable, while others may find turbines, new devices or even research buildings attractive and/or interesting subjects for viewing from roads and trails given their purposes.

Extension of the natural gas line from Highway 93 would have inconsequential long-term visual impacts because the line would be placed underground and the site would be restored according to NREL programs and policies. The construction process for the northern option would temporarily disturb the natural condition of the upper reach of Coal Creek, which is visible from Highway 93 (see Figure 3-2, photograph 21). The construction process for the southern option would be equally visible, but would have less impact because it would involve previously disrupted areas.

Off-site, above ground electricity system improvements would also be visible, but the impact would be inconsequential or minor from public vantage points due to intervening topography and landscape characteristics.

4.5.2 Impacts of the No Action Alternative

The No Action alternative would leave overall site features and associated visual elements unchanged, but views of the site would continue to change with new turbine and tower configurations. The overall number of turbines and towers would remain relatively constant because no new test sites would be added.

MITIGATION MEASURES

There are no significant impacts; therefore no mitigation measures are required under NEPA.

4.6 WATER RESOURCES

Water resource impacts are typically indicated by degradation of the quality of the surface water and groundwater. This section discusses potential impacts to surface water and groundwater from the proposed construction and operating activities. Sampling of surface water and groundwater and/or modeling were not performed in association with the preparation of this section.

Site planning, standard procedures, and the NWTC's "Stormwater Pollution Prevention Program for Construction Activities" would address potential impacts on water resources. Any future incremental and cumulative impacts to surface water, groundwater and stormwater would be insignificant.

4.6.1 Surface Water and Stormwater Impacts

Potential impacts to surface water resulting from the implementation of the Proposed Action would not be significant because NREL's existing programs, policies and practices would avoid or minimize impacts to stormwater during construction and operations at the NWTC. The Proposed Action would not substantially alter surface water hydrology.